TRANSACTION-BASED OBJECT-ORIENTED MULTIPART DATABASE METHOD AND APPARATUS

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FIELD OF THE INVENTION

This invention relates generally to transaction and document exchange, and more particularly to a transaction-based object-oriented multipart database system.

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BACKGROUND OF THE INVENTION

Document and transaction and document exchange is conventionally accomplished through apparatus that encrypts the data and transmits the encrypted data via FTP over the Internet. Optionally, a secure Internet connection, Lotus Notes,

an extranet or secure databases are implemented in the connection. However, these

implementations do not easily integrate into business data processing systems where

multiple parties exchange transactions and documents in a highly integrated network

supporting highly integrated business processes. Furthermore, the topological

5   relationships are static and are not easily modified in response to changes in physical

configuration. What is needed is a system of exchanging documents and transactions

between highly separate parties that have integrated business data processing systems

communicating through a highly integrated network that are more dynamically

configurable to changes in physical configuration.

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SUMMARY OF THE INVENTION

The above-mentioned shortcomings, disadvantages and problems are

addressed by the present invention, which will be understood by reading and

studying the following specification.

15   In an embodiment of a computerized method for a transaction-based object-

oriented multipart database system which includes receiving a transaction, encoding

the transaction into an electronic message, transmitting the electronic message,

receiving the electronic message, decoding the transaction from the electronic

message, and processing the transaction, in which the processing is displaying

20   decoded text of the database transaction record of the electronic message.

Another embodiment of a method includes receiving transactions from at least one service provider and at least one service consumer, each transaction being associated with a service consumer, storing the transactions, enabling access by a service consumer to stored transactions associated with the service consumer to

5 which access is enabled, and accessing the stored transactions associated with the service consumer to which access is enabled, the accessing being performed by the service consumer to which access is enabled.

One embodiment of a computerized system includes a receiver of database transactions, an encoder of electronic mail messages operatively coupled to the

10 receiver of database transactions, the electronic mail messages being encoded with a database transaction record, a transmitter of electronic mail messages operatively coupled to the encoder of electronic mail messages, a receiver of electronic mail messages operatively coupled to the transmitter of electronic mail messages, a decoder of electronic mail messages operatively coupled to the receiver of electronic

15 mail messages, a transmitter of database transaction information operative coupled to the decode, and a database transaction processor operatively coupled to the transmitter of database transaction information.

The present invention describes systems, clients, servers, methods, and computer-readable media of varying scope. In addition to the aspects and advantages

20 of the present invention described in this summary, further aspects and advantages of

the invention will become apparent by reference to the drawings and by reading the

detailed description that follows.

BRIEF DESCRIPTION OF THE DRAWINGS

5   FIG. 1 is a block diagram of the hardware and operating environment in

which different embodiments of the invention can be practiced.

FIG. 2 is a diagram illustrating a system-level overview of an exemplary

embodiment of the invention.

FIG. 3 is a flowchart of a method performed by a client according to an

10   exemplary embodiment of the invention.

FIG. 4 is a flowchart of a method performed by a client according to an

exemplary embodiment of the invention.

FIG. 5 is a flowchart of a method according to an exemplary embodiment of

the invention.

15   FIG. 6 is a flowchart of a method performed by a server according to an

exemplary embodiment of the invention.

FIG. 7 is a flowchart of a method according to an exemplary embodiment of

the invention.

FIG. 8 is a block diagram of an apparatus according to an exemplary

20   embodiment of the invention.

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FIG. 9 is a block diagram of an apparatus according to an exemplary embodiment of the invention.

FIG. 10 is a block diagram of an apparatus according to an exemplary embodiment of the invention.

5   FIG. 11 is a block diagram of an apparatus according to an exemplary embodiment of the invention.

FIG. 12 is a block diagram of an data structure according to an exemplary embodiment of the invention.

FIG. 13 is a block diagram of an object-oriented apparatus according to an

10   exemplary embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

In the following detailed description of exemplary embodiments of the invention, reference is made to the accompanying drawings which form a part hereof,

15   and in which is shown by way of illustration specific exemplary embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that logical, mechanical, electrical and other changes may be made without departing from the scope of the

20   present invention. The following detailed description is, therefore, not to be taken in

a limiting sense, and the scope of the present invention is defined only by the appended claims.

The detailed description is divided into [five] sections. In the first section, the hardware and the operating environment in conjunction with which embodiments

5   of the invention may be practiced are described. In the second section, a system level overview of the invention is presented. In the third section, methods for an exemplary embodiment of the invention are provided. In the fourth section, a particular xxx implementation of the invention is described. Finally, in the fifth section, a conclusion of the detailed description is provided.

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Hardware and Operating Environment

FIG. 1 is a block diagram of the hardware and operating environment 100 in which different embodiments of the invention can be practiced. The description of FIG. 1 provides an overview of a conventional computer hardware and a suitable

15   computing environment in conjunction with which the invention can be implemented. The invention is described in terms of a computer executing computer-executable instructions. However, the invention can be embodied entirely in computer hardware in which the computer-executable instructions are implemented in read-only memory. The invention can also be implemented in

20   client/server computing environments where remote devices that are linked through a

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communications network perform tasks. Program modules can be located in both local and remote memory storage devices in a distributed computing environment.

Computer 110 is operatively coupled to display device 112, pointing device 114, and keyboard 116. Computer 110 includes a processor 118 (e.g. an Intel

5   Pentium processor), random-access memory 120 (RAM), read-only memory 122 (ROM), and one or more mass storage devices 124, and a system bus 126, that operatively couples various system components including the system memory to the processing unit 118. Mass storage devices are more specifically types of nonvolatile storage media and can include a hard disk drive, a floppy disk drive, an optical disk

10   drive, and a tape cartridge drive. The memory 120, 122, and mass storage devices, 124, are types of computer-readable media. A user can enter commands and information into the personal computer 110 through input devices such as a pointing device 115 and a keyboard 116. Other input devices (not shown) can include a microphone, joystick, game pad, satellite dish, scanner, or the like. The processor

15   118 executes computer programs stored on the computer-readable media. The invention is not limited to any type of computer 110. Computer 110 can be a PC-compatible computer, a MacOS-compatible computer or a UNIX-compatible computer. The construction and operation of such computers are well known within the art.

20   Furthermore, computer 110 can be communicatively connected to the Internet

via a communication device 128. Internet 130 connectivity is well known within the

art. In one embodiment, the computer includes a communication device that is a

modem and corresponding communication drivers to connect to the Internet via what

is known in the art as a "dial-up connection." In another embodiment, the computer

5   includes a communication device that is an Ethernet or similar hardware (network)

card connected to a local-area network (LAN) that itself is connected to the Internet

via what is know in the art as a "direct connection" (e.g., T1 line, etc.).

Computer 110 also has at least one operating environment running thereon,

each desirably providing a graphical user interface including a user-controllable

10   pointer. Such operating environments include operating systems such as versions of

the Microsoft Windows™ and Apple MacOS™ operating systems well-known in the

art. The invention is not limited to any particular operating environment, however,

and the construction and use of such operating environments are well known within

the art. Computer 110 also desirably can have at least one web browser application

15   program running within at least one operating environment, to permit users of

computer 110 to access intranet or Internet world-wide-web pages as addressed by

Universal Resource Locator (URL) addresses. Such browser application programs

include Netscape Navigator™ and Microsoft Internet Explorer™.

Display device 112 permits the display of information, including computer,

20   video and other information, for viewing by a user of the computer. The invention is

not limited to any particular display device 112. Such display devices include

cathode ray tube (CRT) displays (monitors), as well as flat panel displays such as

liquid crystal displays (LCD's). Display device is connected to the system bus 126.

In addition to the monitor, computers typically include other peripheral output

5   devices such as printers (not shown), speakers, pointing devices and a keyboard.

Speakers 113 and 114 enable the audio output of signals. Speakers 113 and 114 are

also connected to the system bus 126. Pointing device 115 permits the control of the

screen pointer provided by the graphical user interface (GUI) of operating systems

such as versions of Microsoft Windows™. The invention is not limited to any

10   particular pointing device 115. Such pointing devices include mouses, touch pads,

trackballs, remote controls and point sticks. Finally, keyboard 116 permits entry of

textual information into computer 110, as known within the art, and the invention is

not limited to any particular type of keyboard.

The computer 110 can operate in a networked environment using logical

15   connections to one or more remote computers, such as remote computer 150. These

logical connections are achieved by a communication device coupled to or a part of

the computer 110; the invention is not limited to a particular type of communications

device. The remote computer 150 can be another computer 110, a server, a router, a

network PC, a client, a peer device or other common network node. The logical

20   connections depicted in FIG. 1 include a local-area network (LAN) 151 and a wide-

area network (WAN) 152. Such networking environments are commonplace in

offices, enterprise-wide computer networks, intranets and the Internet.

When used in a LAN-networking environment, the computer 110 and remote

computer 150 are connected to the local network 151 through a network interface or

5   adapter 153, which is one type of communications device. When used in a

conventional WAN-networking environment, the computer 110 and remote computer

150 communicate with a WAN 152 through modems (not shown). The modem,

which can be internal or external, is connected to the system bus 126. In a

networked environment, program modules depicted relative to the personal computer

10   110, or portions thereof, can be stored in the remote memory storage device.

System Level Overview

A system level overview of the operation of an exemplary embodiment of the

invention is described by reference to FIG. 2 and FIG. 3. The concepts of the

15   invention are described as operating in a multi-processing, multi-threaded operating

environment on a computer, such as computer 110 in FIG. 1.

In FIG. 2, system 200 includes and Action Record 210 that is input to an

Action Processor 220. The Action Processor generates an Action Object 230 from

the Action Record 210.

20   In FIG. 3, system 300 includes an Action Object 310 that is input to an

Action Processor 320. The Action Processor 320 generates an Action Record 330 from the Action Object 310.

The system level overview of the operation of an exemplary embodiment of the invention has been described in this section of the detailed description. An action

5　processor that generates an action object from in input action or that generates an action object from an input action record. While the invention is not limited to any particular action, for sake of clarity a simplified action has been described.

Multipurpose Internet Mail Extensions (MIME). RFC1521. Extensions to the

10　Internet mail format that allow it to carry multiple types of data (binary, audio, video, graphics, etc.) as attachments to email messages.

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Methods of an Exemplary Embodiment of the Invention

In the previous section, a system level overview of the operation of an exemplary embodiment of the invention was described. In this section, the particular methods performed by the server and the clients of such an exemplary embodiment

5   are described by reference to a series of flowcharts. The methods performed by the clients constitute computer programs made up of computer-executable instructions. Describing the methods by reference to a flowchart enables one skilled in the art to develop such programs including such instructions to carry out the methods on suitable computerized clients (the processor of the clients executing the instructions

10   from computer-readable media). Similarly, the methods performed by the server constitute computer programs also made up of computer-executable instructions. Describing the methods by reference to flowcharts enables one skilled in the art to develop programs including instructions to carry out the methods on a suitable computerized server (the processor of the clients executing the instructions from

15   computer-readable media).

Referring first to FIG. 4, a flowchart of a method 400 performed by a client according to an exemplary embodiment of the invention is shown. Method 400 is performed by a client program executing on a computer, such as computer 110 in FIG. 1, and is inclusive of the acts required by an action processor.

20   Method 400 starts with the receipt of an action 410. In one embodiment, an

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action is a database transaction that includes an action and at least one operand.

Thereafter, the action is encoded into an electronic message 420. In one

embodiment, the encoding is performed in reference to a data template that identifies

a superset of actions that various clients and servers implement. More specifically,

5   particular clients and servers implement a subset of all actions within a greater realm

of actions. Therefore, a generalized method 400 is implemented to support all

actions, and the method uses a template that describes all actions in the encoding 420

so that all actions are recognized and encoding accordingly. Actions that are not

described in the template are unrecognized and are not encoded. In another

10   embodiment, the electronic message is a is an email message compliant to Simple

Mail Transfer Protocol (SMTP), File Transfer Protocol (FTP) defined in Internet

Engineering Task Force (IETF) Request for Comments (RFC) 1123, Secure

Electronic Transaction Protocol (SET), Multipurpose Internet Mail Extensions

(MIME), extensions to the Internet mail format that allow it to carry multiple types

15   of data (binary, audio, video, graphics, etc.) as attachments to email messages, or

Lotus Notes, as is well-known to those skilled in the art.

In yet another embodiment, an action is a request for service. After encoding

of the action into an electronic message 420, the electronic message is transmitted

430. The electronic message is received 440 and the electronic message is decoded

20   450 into an action. In the decoding 450, a data template is used as in the encoding

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420. Finally, the action is processed 460, or in another embodiment, executed. In

yet another embodiment, the text of the decoded action is displayed via browser. In

still another embodiment, where the action is a database transaction, the processing is

execution of the operation through a databasebase management system (DBMS)

5   using the operand of the action. Thereafter, the method 400 ends.

Referring to FIG. 500, a flowchart of a method 500 performed by a client

according to an exemplary embodiment of the invention is shown. Method 500 is

performed by a client program executing on a computer, such as computer 110 in

FIG. 1, and is inclusive of the acts required by an action processor.

10   Method 500 starts with creating a transaction object 510 on a client computer,

such as computer 110 in FIG. 1. A transaction object includes updating a local

database using the transaction object 520, encoding the transaction object 530, and

transmitting the encoded transaction object 540 to a remote computer, such as 150 in

FIG. 1. Transmission can be accomplished in compliance to protocols of varying

15   embodiments, such as eXtensible Markup Language (XML), American National

Standards Institute (ANSI) Electronic Data Interchange (EDI), Standard Generalized

Markup Language (SGML) or Microsoft™ Channel Definition Format (CDF).

Thereafter, the encoded transaction object is received at the remote computer 550,

the encoded transaction object is decoded or unencoded 560, and a database at the

20   remote computer is updated using the transaction object 570. Thereafter, method

500 ends.

Referring to FIG. 600, a flowchart of a method 600 performed by a client and a server according to an exemplary embodiment of the invention is shown. Method 600 is performed by a client program executing on a computer, such as

5 computer 110 in FIG. 1, and server program executing on a computer, such as computer 150 in FIG. 1, and is inclusive of the acts required by an action processor.

Method 600 starts with receiving one or more transactions from a provider of services or receiving a transaction from a consumer of services 610 . In either case, because each activity involves a consumer of services, each transaction is associated

10 with a service consumer. In an object-oriented embodiment, the association with a consumer of services is indicated by an attribute indicating the consumer of the service. In another embodiment, the association is indicated by a field indicating the consumer. In one embodiment, the transactions are received by a server computer, such as computer 150 in FIG. 1 from a client computer, such as computer 110 in

15 FIG. 1. Thereafter, the transaction is stored by the server computer 620. Subsequently, access by a consumer of services to the stored transactions associated with the service consumer is enabled 630. The service consumer is one of the service consumers that are associated with the transactions received 610 and stored 620. Finally, the stored transactions to which access was enabled are accessed 640 by a

20 client computer, such as computer 110 in FIG. 1. Thereafter, the method 600 ends.

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FIG. 7 is a flowchart of a method 700 according to an exemplary embodiment of the invention. Method 700 begins upon an initial meeting with Client, a service matter will be created 710 by an associated Service Provider. This service matter will be stored in a Service Database and will be accessible via the Internet to both the

5   Client and the Service Provider. In one embodiment of action 710, the initial meeting takes place with a new Client and later, using the Service Database, the Service Provider creates a new service matter in the Service Database. The Client is provided with a username/password and URL address of a secure site. In another embodiment of action 710, the initial meeting takes place with an existing Client and

10   the Service Provider creates a new service matter in the Service Database and the Service matter is appended to set of pre-existing service matters associated with that Client. After action 710, actions 720, 730, 740, 750, 760, 770, 780, 790, and 795 can occur in any chronological order.

Clients use a browser-based interface to access service matter data 720. The

15   Clients will log in to the system and only have access to service matters associated with them. In one embodiment of action 720, a new Client uses the username/password to log in to secure site, and the Client is presented with a view of containing only one service matter, the service matter that was created in step 710. In another embodiment of action 720, an existing Client logs in to secure site and the

20   existing Client is presented with a view containing all current (not closed out) service

matters including the newly created service matter. In another embodiment of action

720, all Clients will be able to view the data for a particular service matter and tailor

the view based on available filters. These filters include time, Service Provider(s),

billings, actions due. In one embodiment of viewing based on filters, a Client selects

5   a filter of "actions due" in which Service matters are sorted in descending order with

the number of action items due as the sorted upon field. In another embodiment of

viewing based on filters, a Client selects Service Provider name(s) and thereafter,

service matters handled only by specified Service Provider(s) are displayed. In yet

another embodiment of viewing based on filters, a Client specifies Service Provider

10   names and selects a filter of "actions due" and thereafter Service matters handled

only by specified Service Provider(s) are displayed in descending order of the

quantity of actions due. In yet another embodiment of action 720, a Service Provider

uses a browser interface executing on a computer 100 in FIG. 1 to view service

matters for various Clients. In a more specific embodiment, a Service Provider logs

15   in to secured site and is provided with a list of service matters that the Service

Provider is involved with. In another more specific embodiment, Service Provider

with 'super' privileges logs in and thereafter views all service matters currently

stored in the Service Database.

Several persons from the same organization will simultaneously view various

20   different service matters belonging to that particular organization. In one

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embodiment, employee 'A' logs in and views service matters pertaining to him while

employee 'B' logs in and views service matters specific to employee 'B' in which

'A' and 'B' are working on separate items. In another embodiment, employee 'B'

logs in and views service matters and Employee 'B' logs in and looks at the same

5   data as 'A'.

A client will receive automatic email reminders of actions due 730 . These

reminders may be sent out to multiple persons within the Client organization. In on

embodiment of action 730, a Service Provider generates a list of actions due by the

Client. Upon generation, email is sent out to Client referencing the service matters

10   involved. In another embodiment of action 730, a Service Provider generates a list

of actions due by various persons at the Client organization in which Email

containing the action due information is transmitted to the responsible person at the

Service Provider, and also has the choice to "carbon-copy" (CC) or "blind-carbon-

copy" (BCC) persons not directly involved with the due action.

15   Service Providers will set alarms 740. In one embodiment, an existing

service matter, the Service Provider sets alarm events and when the system time

reaches the alarm time email is sent out to Service Provider reminding him/her about

pending alarm. In another embodiment the Service Provider logs in to system and

acts on the alarm thus marking it finished. In yet another embodiment, when an

20   alarming event is not satisfied, up to n alarms are generated at a predetermined time

interval.

Service providers receive email notification prior to the alarms triggering 750. Action 740 must occur prior to action 750 for each individual alarm. In one embodiment, the time and number of times the alarms occur will be settable. In

5   another embodiment, the Service Provider receives multiple alarms before acting upon that alarm event. In yet another embodiment, after an action is completed, the alarm associated with the action is removed.

Clients receive transmitted data 760. In one embodiment, a Client logs in and downloads all data related to selected service matters. Client uses programs

10   which use API's provided by Service Provider to access data. In another embodiment, Clients will only be allowed a static view of data on data stored by Service Provider.

After action 760, the data transmitted in action 760 is merged into the client's own private data store 770. In one embodiment, the Client uses API's provided by

15   Service Provider to merge into internal database.

The Client and the Service Provider will view log of action items pending Service Provider/Client review 780. T

The Client or the Service Provider will submit request to download data 790 which is fulfilled by transmitting the data. In one embodiment, a client logs in and

20   selects a particular service matter in which, for that service matter, the Client views

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the current draft and selects File Transfer Protocol (FTP) link to download document and finally the document is transmitted to the Client's computer.

The Client or Service Provider annotates existing documents 795. In on embodiment, the Client logs in and selects to view a certain service matter. Then the

5   Client views the current draft of the service matter, and finally, the client adds and saves annotations to the draft.

Following is table 1 that identifies the system privileges of the Service Provider a Client with basic privileges, and a Client with advanced privileges. There is a "System administrator" who will manage accounts for Service Providers and

10   Clients:

ROLES→	Service Provider	Client (Basic)	Client (Advanced)
Privilege			
Create Service matter	Yes	No	No
Delete Service matter (Abandon)	Yes	No	No
Close Service matter	Yes	No	No
View Service matter	Yes	Yes	Yes
Add Inventors	Yes	No	No
Delete Inventors	Yes	No	No
Add alarms (email reminders)	Yes	Yes	Yes
Leave messages	Yes	Yes	Yes
Create Action Items (Action proc.)	Yes	Yes	Yes
View Action Items	Yes	Yes	Yes
View billing information	Yes	No	Yes
Create Client "inboxes" ??	Yes	No	No
Correspond via system	Yes	Yes	Yes
Create personal view profiles	Yes	Yes	Yes

30   Table 1

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The particular methods performed by remote database synchronization of an exemplary embodiment of the invention have been described. The method performed by remote database synchronization has been shown by reference to a flowchart including all the acts from remote database synchronization until a

5   transaction-based object-oriented multipart database.

Object-oriented Implementation

In this section of the detailed description, a particular object-oriented implementation apparatus 800 and 900 of the invention is described in conjunction

10   with the system overview in FIG. 2 and FIG. 3 and the methods described in conjunction with FIG. 4, FIG. 5 and FIG. and 6. **(what is an object? The traditional definition of encapsulated data and methods doesn't seem to work because there are no methods).**

In Fig. 8, an apparatus 800 includes a database 810 that enables a DBMS 820

15   to retrieve an action record (not shown) from the database 810. The action record is a fixed-field record identifying a service. The DBMS 820 transmits the action record to the action processor 830, which generates an action object 840 from the action record. An action object 840 identifies a service.

In Fig. 9, an apparatus 900 includes an action object 910 that is transmitted to

20   the action processor 920. An action object 910 identifies a service. The action

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processor 920 generates an action record (not shown) from the action object 910.

The action record is transmitted to a DBMS 930, which performs the action on a

database 940.

Email-based Implementation

5   In this section of the detailed description, a particular email-based

implementation apparatus 1000 of the invention is described in conjunction with the

system overview in FIG. 2 and FIG. 3 and the methods described in conjunction with

FIG. 4, FIG. 5 and FIG. and 6 that is email-based.

In FIG. 10, an apparatus 1000 includes a client computer 1005, such as

10   computer 110 in FIG. 1. The client transmits an action to a server 1090, which

includes a receiver of actions 1010. In one embodiment, the action is a database

transaction that is identified by a phase and task, and that also includes a description,

such as any one of the following in Table 2:

PHASE	TASK	DESCRIPTION
P50	051	Non-Prosecution matters
P75	051	Miscellaneous Non-Fixed Fee
P100	110	Novelty Searching
P100	120	Drafting Opinion
P200	210	Intake - CMG File setup
P200	220	Drafting & Filing (Includes Preliminary Amendments)
P200	230	Drawings
P200	240	Sequence Listings
P300	320	Original Filing - Information Disclosure Statements
P300	321	Original filing - Response to 1st Nonfinal Office Action
P300	322	Original Filing - Response to 2nd Nonfinal Office Action
P300	323	Original Filing - Response to First Final Office Action
P300	324	Original Filing - Response to Second Final Office Action
P300	325	Original Filing - Post Filing Formalities
P300	326	Original Filing - All other communication to USPTO

	P300	327	Original Filing - Allowance and Issue Activity
	P300	328	Original Filing - Miscellaneous prosecution matters
	P300	350	All other billing beyond second FWC
	P300	360	Translation
5	P400	410	Notice, Research and Brief Writing
	P400	420	Oral Argument
	P500	510	Post Issuance
	P600	610	Preliminary Statement
	P600	620	Affadavit and Expert Witness Prep
10	P600	630	Legal Research
	P600	640	Motion Drafting
	P600	650	Testimony
	P600	660	Briefs and Final Hearing
	P300	330	First FWC - Information Disclosure Statements
15	P300	340	Second FWC - Information Disclosure Statements
	P300	331	First FWC - Response to First Nonfinal Office Action
	P300	341	Second FWC - Response to First Nonfinal Office Action
	P300	332	First FWC - Response to Second Nonfinal Office Action
	P300	342	Second FWC - Response to Second Nonfinal Action
20	P300	333	First FWC - Response to First Final Office Action
	P300	343	Second FWC - Response to First Final Office Action
	P300	334	First FWC - Response to Second Final Office Action
	P300	344	Second FWC - Response to Second Final Office Action
	P300	335	First FWC - Post Filing Formalities
25	P300	345	Second FWC - Post Filing Formalities
	P300	336	First FWC - All other communications to USPTO
	P300	346	Second FWC - All other communications to USPTO
	P300	337	First FWC - Allowance and Issue Activity
	P300	347	Second FWC - Allowance and Issue Activity
30	P300	338	First FWC - Miscellaneous prosecution matters
	P300	348	Second FWC - Miscellaneous prosecution matters
	P700	710	Intake - CMG File setup
	P700	720	Drafting and Filing (including Preliminary Amendments)
	P700	730	Drawings
35	P700	740	Sequence Listings
	P800	810	PCT - Report and response International search report
	P800	820	PCT - Report and response written opinion
	P800	830	PCT - Report International Preliminary Examination
	P800	840	PCT - Post filing formalities
40	P800	850	PCT - Report Chapter II Demand
	P800	860	Foreign miscellaneous - non PCT
	P800	855	PCT - Miscellaneous

Table 2

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In another embodiment, the action is an accounting of services rendered. The receiver 1010 in varying embodiments stores and retrieves the actions in a manner that is well-known to those skilled in the art, such as a queue, a file or database. The receiver 1010 of the server 1090 sends the actions to an encoder 1020. In varying

5 embodiments, the encoder 1020 generates a data stream from the action that is encoded compliant to any one of the various protocols well-known to those skilled in the art, such as Simple Mail Transfer Protocol (SMTP), File Transfer Protocol (FTP) defined in Internet Engineering Task Force (IETF) Request for Comments (RFC) 1123, Secure Electronic Transaction Protocol (SET), Multipurpose Internet Mail

10 Extensions (MIME) or Lotus Notes. In another embodiment, the encoder 1020 may be a browser extended with a plug-in or add-in component well-know to those skilled in the art. The data streams being encoded with an action record. The server 1090 further includes a transmitter 1030 of the data stream operatively coupled to the encoder that transmits the encoded action to a computer 1095, that in varying

15 embodiments is a email server or a client. Computer 1095 includes a receiver of encoded action 1040 operatively coupled to the transmitter 1030 of server 1090. In one embodiment, the receiver 1040 is an email server. The receiver 1040 in varying embodiments includes a queue, a file or database for storing and retrieving the actions that is well-known to those skilled in the art. Receiver 1040 in varying

20 embodiments communicates to the transmitter 1030 via the Internet, a wide-area

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network (WAN) or a local-area network (LAN). Computer 1095 further includes a

decoder 1050 operatively coupled to the receiver 1040. In varying embodiments, the

decoder 1050 decodes database transaction from the data stream according to the

protocol or format of the data stream that is well-known to those skilled in the art,

5   such as Simple Mail Transfer Protocol (SMTP), File Transfer Protocol (FTP) defined

in Internet Engineering Task Force (IETF) Request for Comments (RFC) 1123,

Secure Electronic Transaction Protocol (SET), Multipurpose Internet Mail

Extensions (MIME) or Lotus Notes. In another embodiment, the encoder 1050 may

be a browser extended with a plug-in or add-in component well-known to those

10   skilled in the art. The server 1095 also includes a transmitter of actions 1060

operatively coupled to the decoder that transmits the action to a database transaction

processor 1070. In one embodiment, the action processor 1070 is a database

management system (DBMS) well-known to those skilled in the art, such as

Microsoft SQL Server™ in which the DBMS uses the action to update the database

15   1080. In another embodiment, the action processor 1070 is an email browser which

displays the action.

FIG. 11 is a block diagram of an apparatus 1100 according to an exemplary

embodiment of the invention. System 1100 includes a service database 1110 that

stores objects or records describing service actions. The service database 1110

20   transmits actions 1120 to an action processor 1130. The action processor also

receives actions 1140 from other electronic sources. The action processor 1130

encapsulates the actions 1130 and 1140 into action objects 1150 and transmits the

action objects 1150 to a server 1160. The server 1160 stores and retrieves action

objects to a database 1170. The server 1160 exchanges action objects with one or

5   more client computers 1180.

FIG. 12 is a block diagram of an data structure 1200 according to an

exemplary embodiment of the invention. FIG. 12 describes the structure of matters

described above in one embodiment in association with FIG. 7. Each individual at a

service provider has access to a number of matters, matter1 1210, matter2 1220,

10   matter 3 1230, matter n 1240. Each matter 1245 includes a number of data objects,

such as a billing record 1250, an attorney record 1260, an inventor record 1270, or

actions items 1280 and 1290.

FIG. 13 is a block diagram of an object-oriented domain apparatus 1300

according to an exemplary embodiment of the invention.

15   The figure uses the Unified Modeling Language (UML), which is the

industry-standard language for specifying, visualizing, constructing, and

documenting the object-oriented artifacts of software systems. In the figures, a

hollow arrow between classes is used to indicate that a child class below a parent

class inherits attributes and methods from the parent class. In addition, a solid-filled

20   diamond is used to indicate that an object of the class that is depicted above an object

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of another classes is composed of the lower depicted object. Composition defines the attributes of an instance of a class as containing an instance of one or more existing instances of other classes in which the composing object does not inherit from the object(s) it is composed of.

5   Each client 1310 is composed of any number of accounts 1320. A client 1310 may exist with no accounts 1320. Each account 1320 is composed of any number of matters 1330 as described in FIG. 12 and FIG. 7. An account 1320 may exist with no matters 1330. Each matter 1330 includes an indication of the stage of the matter, which is one position of many positions of a service process. Each matter

10   is composed of any number of licensee representatives 1340, and actions 1370, and one intellectual property lawyer representative 1350 and one client representative 1360. Each licensee representative 1340 is composed of an indication of an attorney, and a billee and one or more individuals 1390. Moreover, each intellectual property lawyer law representative 1350 and each client representative 1360 also are

15   composed of one or more individuals 1390. Furthermore each intellectual property law lawyer representative 1350 includes an indication of an attorney, an indication of a paralegal and an indication of a case management group representative and each client representative 1360 includes an indication of an attorney, and indication of a inventor, and indication of an owner, and an indication of a billee. Each action 1370

20   includes an indication of an intellectual property law lawyer and a client. Each action 1370 is also associated with a trigger 1380.

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